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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/554,304

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Xiyuan Chen

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EXAMINER

AMIRMOKRI, JALALEDDIN

ART UNIT

PAPER NUMBER

2617

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DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/554,304	Applicant(s) CHEN ET AL.	
	Examiner JALELEDDIN AMIRMOKRI	Art Unit 2617	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 October 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 October 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>10/17/06</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Status

This is in response to application filed on October 06, 2006 in which claims 1-7 are presented for examination.

Information Disclosure Statement

1. The information disclosure statement (IDS) submitted on 10/17/2006 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Claim Objections

2. Claim 1 is objected to because of the following informalities: In line 2 the term "VBS" lacks antecedent basis. In line 11, the term "cluster" lacks antecedent basis. In line 26, "CI" lack antecedent basis. In line 30, the term "c" lacks antecedent basis. In lines 34 and 36 the term "cell cluster" should be changed to "the cell cluster".

Appropriate correction is required.

Specification

3. The abstract of the disclosure is objected to because in line 2, the start of the sentence "the size of" should be capitalized. Correction is required. See MPEP § 608.01(b).

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4. The disclosure is objected to because of the following informalities: Page 1, line 16, the phrase "set of cell" is incorrect and should be changed to "set of cells". Page 1, line 23, the phrase "how to adjust" is incomplete and should be changed to "how to adjust it". Page 1, line 30, the phrase "different size" should be changed to plural, "different sizes". Page 3, line 33, "HCS" lack antecedent basis. Page 4, line 22, the phrase "see from" is improper, should be changed to "seen from". Page 5, line 2, the phrase "inter-cell cluster" is unclear or incorrect. Page 5, line 38, the term "soft capacity" lacks description. Page 5, line 42, the phrase "may be exist" is improper and should be changed to "may exist". Page 6, line 14, the term "compact in phrase "should be compact to each other" is improper; other terms such as "near" or "close" is recommended. Page 6, line 17 the phrase "which leads to that too many" is improper and should be changed to "which leads to too many". Page 6, lines 41-42, the phrase "user equipment being in progress of call is moves" is improper and should be changed to "user equipment in progress of a call moves". Page 7, lines 4-5, the phrase "user equipment being in progress of call is moves" is improper and should be changed to "user equipment in progress of a call moves". Page 7, line 12, there is an improper character (o) at the end of the phrase "where $i=1, \dots, N_{\underline{o}}$ ". Page 7, line 14, there is an improper character (o) at the end of the term " $TD_{\underline{o}}$ ". Page 7, line 16, the phrase "serving are contains" is incorrect it should be changed to "serving area contains". Page 7, line 34, Appropriate corrections are required. See MPEP § 608.01(b).

Claim Rejections - 35 USC § 112

5. Claim 1 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The independent claim 1 recites formulas for determining a target cost function. The formulas do not show which the target cost function is nor they show what the solution is. For instance formula 2 is supposed to be defining formula 1, but the variable x of formula 2 is not found in formula 1, or the relationship of formulas 5 and 6 to others. There seems to be a lack of cohesion in the formulas recited and how they interrelate to each other. Without additional guidance, there would be undue experimentation as to how to determine the target cost for the selection process.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1, 2 and 5 are rejected under 35 U.S.C 103(a) as being unpatentable over Okajima et al. (US Patent Application Publication No. 2001/0018346) in view of Quinquis et al. (US Patent No. 6,243,363).

selection of cluster is made based on the following minimized target cost

functions: c_1 .times. k .times. $sc_k + c_2$.times. i .times. j .times. h_{ij} .times. $z_{ij} + c_3$.times. i .times. j .times. h_{ij} .function. $(w_{ij} - z_{ij}) \cdot (1)$ where: k .times. $x_{ik} = 1$, .times. for .times. .times. all .times. .times. i , (2) $w_{ijk} \leq x_{ik}$, $w_{ijk} \leq x_{jk}$, $w_{ijk} \geq x_{ik} + x_{jk} - 1$, for all i, j and k (3) $z_{ijm} \leq x_{ik}$, $z_{ijm} \leq x_{jm}$, $z_{ijm} \geq x_{im} + x_{jm} - 1$, for all i, j and m (4) i .di-elect cons. S .times. .times. 1 k .times. j .di-elect cons. S .times. .times. 2 k .times. $B_{ij} \geq 1$ (5) i .times. i .circleincircle. j .times. $w_{ij} \leq B_{ij}$.times. $B_{ij} \leq C_i$.times. i .times. i .circleincircle. j .times. B_{ij} (6) where: c_1 , c_2 and c_3 represent respective weights of these three cost functions in total cost function, and $c_1 + c_2 + c_3 = 1$; i, j denote cells i and j ; k denotes cell cluster, and m denotes VBS; $SC_{sub.k}$ is soft capacity of cell cluster k ; $h_{sub.ij}$ is handover loading from cell i to cell j ; $z_{sub.ij} = 1 - \sum_{m \in VBS} z_{sub.ijm}$, where $z_{sub.ijm}$ is a binary variable, and when cells i and j belong to VBS m , $z_{sub.ijm} = 1$; $w_{sub.ij} = 1 - \sum_{k \in VBS} w_{sub.ijk}$, where

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$w_{sub.ijk}$ is a binary variable, and when cells i and j belong to cell cluster k , $w_{sub.ijk}=1$; $x_{sub.ik}$ is a binary variable, and when cell i belongs to cell cluster k , $x_{sub.ik}=1$; $x_{sub.jk}$ is a binary variable, and when cell j belongs to cell cluster k , $x_{sub.jk}=1$; $x_{sub.im}$ is a binary variable, and when cell i belongs to VBS m , $x_{sub.im}=1$; $x_{sub.jm}$ is a binary variable, and when cell j belongs to VBS m , $x_{sub.jm}=1$; if cell i is adjacent to cell j , $B_{sub.ij}=1$; $S1_{sub.k}$ is a subset of $CBS_{sub.k}$, that is, $S1_{sub.k} \cap CBS_{sub.k} = \emptyset$ and $S1_{sub.k} \cup CBS_{sub.k} = CBS_{sub.k}$; $S2_{sub.k}$ is a complementary set for $S1_{sub.k}$, and $S2_{sub.k} = CBS_{sub.k} - S1_{sub.k}$; $CBS_{sub.k}$ is a set of cells included in cell cluster k (as rejected under 35 U.S.C. 112, first paragraph above).

Okajima fails to teach that macro-diversity management corresponds to one mobile server, and the mobile server contains load information and handover information of all cells included in the VBS area.

Quinquis teaches that macro-diversity management corresponds to one mobile server, and the mobile server contains load information and handover information of all cells included in the VBS area (as described in column 2, lines 27-46).

Therefore it would have been obvious to a person with ordinary skill in the art at the time the invention was made to modify Okajima to utilize a mobility sever to perform macro-diversity or soft-handover as described by Quinquis in order to perform a more effective handover and hence provide an efficient and versatile mobile communication system to the user.

Regarding claim 2, Okajima teaches that different VBSs can exchange information between each other whereby macro-diversities of inter-cluster and inter-

VBS are performed (as described in paragraph [0013], lines 1-18 and paragraph [0064], lines 1-18)

Okajima fails to teach that the macro-diversity is performed through the mobile server.

Quinquis teaches that the macro-diversity is performed through the mobile server (as described in column 2, lines 27-46).

Therefore it would have been obvious to a person with ordinary skill in the art at the time the invention was made to modify Okajima to utilize a mobility sever to perform macro-diversity or soft-handover as described by Quinquis in order to perform a more effective handover and hence provide an efficient and versatile mobile communication system to the user.

Regarding claim 5, Okajima teaches that the selection of the parent base station is adaptively adjusted (as described in paragraph [0064], lines, 1-18).

Okajima dos not specifically teach that the adjustment is based on information about inter-cell load change and handover change collected by the mobile server and change of size of the cell cluster.

Quinquis teaches that the adjustment is based on information about inter-cell load change and handover change collected by the mobile server and change of size of the cell cluster (as described in column 2, lines 47-65).

Therefore it would have been obvious to a person with ordinary skill in the art at the time the invention was made to modify Okajima to utilize the information provided by the mobility sever as described by Quinquis in order to perform the parent cell

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adjustments and hence provide a more efficient and versatile mobile communication system to the user.

8. Claim 3 is rejected under 35 U.S.C 103(a) as being unpatentable over Okajima et al. in view of Quinquis et al. and further in view of Walton et al. (US Patent No. 6,493,331).

Regarding claim 3, Okajima in view of Quinquis does not specifically teach that a multiple-services user in a cell, the user with higher data rate is normalized into several users with lower data rate.

Walton teaches that a multiple-services user in a cell, the user with higher data rate is normalized into several users with lower data rate (as described in column 25, lines 32-40).

Therefore it would have been obvious to a person with ordinary skill in the art at the time the invention was made to modify Okajima in view of Quinquis to include normalization of higher data rates into multiple lower data rates as described by Walton in order to reduce transmission complexity, power requirements and interference and hence provide a more reliable and robust mobile communication system to the user.

9. Claims 4, 6, and 7 are rejected under 35 U.S.C 103(a) as being unpatentable over Okajima et al. in view of Quinquis et al. and further in view of Hervey et al. (US Patent Application Publication No. 2002/0122461).

Regarding claim 4, Okajima in view of Quinquis does not specifically teach that the requirements for transmit power of user equipment is reduced by means of the parent base station performing macro-diversity on signals from the same user equipment received by all cells of the cell cluster, and interference level and load of uplink of the cell are also reduced.

Hervey teaches that the requirements for transmit power of user equipment is reduced by means of the parent base station performing macro-diversity on signals from the same user equipment received by all cells of the cell cluster, and interference level and load of uplink of the cell are also reduced (as described in paragraph [0063], lines 22-26).

Therefore it would have been obvious to a person with ordinary skill in the art at the time the invention was made to modify Okajima in view of Quinquis to utilize macro-diversity to reduce the transmit power requirements of the mobile stations (MS) as described by Hervey in order to reduce MS's power requirements as well as to reduce the interference and hence provide a more reliable and robust mobile communication system to the user.

Regarding claim 6, Okajima in view of Quinquis does not specifically teach that the mobile server is a database, which contains the load information and handover information of all cells included in a VBS area.

Hervey teaches that the mobile server is a database, which contains the load information and handover information of all cells included in a VBS area (as described in paragraph [0058], lines 1-6).

Therefore it would have been obvious to a person with ordinary skill in the art at the time the invention was made to modify Okajima in view of Quinquis to utilize a database as described by Hervey in order to store macro-diversity load information and hence provide an efficient and versatile mobile communication system to the user.

Regarding claim 7, Okajima in view of Quinquis fails to teach that the base stations in all cells of VBS area are connected to the mobile server in a wired manner, handover information of all users in a VBS area and load information of each cell are transmitted to the mobile server through base station, and the statistical information is obtained from the mobile server.

Hervey teaches that the base stations in all cells of VBS area are connected to the mobile server in a wired manner, handover information of all users in a VBS area and load information of each cell are transmitted to the mobile server through base station, and the statistical information is obtained from the mobile server (as described in paragraphs [0058] to [0063]).

Therefore it would have been obvious to a person with ordinary skill in the art at the time the invention was made to modify Okajima in view of Quinquis to utilize the bases stations to provide the handover information to the mobility server as described by Hervey in order to enable the mobility server to perform macro-diversity management and hence provide an efficient and versatile mobile communication system to the user.

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to JALALEDDIN AMIRMOKRI whose telephone number is (571)270-5880. The examiner can normally be reached on M-F 8am-5m EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexander Eisen can be reached on (571)272-7687. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J.A./

03/20/09

/Alexander Eisen/
Supervisory Patent Examiner, Art Unit 2617